PHYS040B: **Formulae**

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0 General relationships

$$\mathbf{F} = -\boldsymbol{\nabla} U \qquad U = -\int \mathbf{F} \mathrm{d}x$$

$$K = \frac{p^2}{2m} \qquad a_r = \frac{v^2}{r}$$

1 Gravitation

$$\mathbf{F} = \frac{G m_1 m_2}{r^2}\ \hat{r} \qquad U = -\frac{G m_1 m_2}{r}$$

$$v = \sqrt{GM/r} \qquad T^2 = \frac{4\pi^2}{GM} r^3$$

2 Fluids

$$P = \frac{F}{A}$$
$$P = P_0 + \rho g d$$
$$F_1 = \frac{A_1}{A_2} F_2 + \rho g h A_1$$
$$F_B = \rho_f V_f g$$
$$v_1 A_1 = v_2 A_2$$
$$P + 1/2 \rho v^2 + \rho g h = \text{constant}$$

3 Oscillations